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- (54) Title  
SPECIAL MULTIFUNCTIONAL APPLICATIONS FOR CONTACT AND/OR CONTACTLESS DATA TRANSMISSION SYSTEMS VIA MICROPROCESSOR CARD FOR THE PURPOSE OF EXECUTION OF AIR TRAVELLING FORMALITIES AND PERSONAL IDENTIFICATION
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Special multifunctional applications for contact and/or contactless data transmission systems via microprocessor cards for the unerring identification of persons at boarder traffic and/or for the control of persons domestically as well as especially in the field of airtravelling (but also for everyday), from preparation until finalizing, useful referring to velocity and execution of necessary transactions as well as for the security of passengers.

Especially e.g. for the execution of air travelling formalities referring to the passenger like booking and/or rebooking of flighttickets, reservations, check-in, ticket control at the gate, ticketcontrol at boarding, individual information, payment of expenses.

By the storage of specific biometric characteristics of the card holder on the card, namely the threedimensional hand- and/or face geometry, a definite, unerring identification of the card holder is possible.

The microprocessor card implemented with hardwired logic works on base of radio frequency with the functionality of a multiapplication card, e.g. due to its multifunctionality, the card can be used for different independent applications.

CLAIM

1. Special multifunctional applications for contact and/or contactless data transmission systems via microprocessor cards characterized in that the microprocessor card working on radio frequency base implemented with hardwired logic is multifunctional, e.g. several functions independent from each other can be united on one card.

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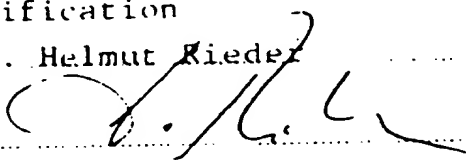
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## COMPLETE SPECIFICATION STANDARD PATENT

certify that the following .....10..... pages are a true and correct copy of the description and claims of the original complete specification in respect of an invention entitled Special multifunctional applications for contact and/or contactless data transmission systems via microprocessor card for the purpose of execution of air travelling formalities and personal identification

Name of Applicant..... Dr. Helmut Rieder

Signature .....



Special multifunctional applications for contact and/or contactless data transmission systems via microprocessor card for the purpose of execution of air travelling formalities and personal identification

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### Specification

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### Field of Invention

The invention relates to special multifunctional applications for contact and/or contactless data transmission systems via microprocessor cards a) for the unerring identification of persons at boarder traffic and/or for the control of persons domestically as well as b) especially in the field of airtravelling (but also for everyday), from preparation until finalizing, useful referring to velocity and execution of necessary transactions as well as for the security of passengers.

Especially e.g. for the execution of air travelling formalities referring to the passenger like booking and/or rebooking of flight tickets, reservations, check-in, ticket control at the gate, ticketcontrol at boarding, individual information, payment of expenses.

By the storage of specific biometric characteristics of the card holder on the card, namely the threedimensional hand- and/or face geometry, a definite, unerring identification of the card holder is possible.

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### Background of Invention

5 Using the invention as electronical flight ticket, the passenger books his flight or flights via tourist office, telephone or directly via internet or interactive television. The electronical flight ticket is then stored on the card via an appropriate technical facility at home or in the office like  
10 e.g. fax modem, PC and antenna.

Or, the reservation is stored on a server, from where it can be called in by node terminals and/or by terminals at the airports and , by the use of e.g. a customer number number already stored on the card, and/or an identification number (PIN Code) and/or  
15 biometric identification , can be called in and stored on the particular passenger's card within a split second. From the card, the ticket can be fetched at each control, rebookings can be made, information can be called in.

20 Using the invention as electronical passport and/or visa, all relevant data of the card holder are stored on the card, from where they can be fetched and controlled fast and efficiently at frontier crossing points, which are via terminals and node terminals connected with a server. A data transmission,  
25 referring to the quantity of data of a normal passport, from the electronical passport and/or visa into a network takes less than 0.1 seconds.

Until now there are known magnetic stripe card for cashless  
30 payment and/or for the identification of persons. Disadvantageous at this magnetic stripe cards is the low storage capacity, the need of special costly machinery for data transmission as well as the comparatively easy misuse at theft.

35 Advantageous at the present invention is the use of contactless transmission of data, necessary for certain transactions. A transaction between the card and the reader takes place when the

card holder moves the card over the reader. The working distance between reader and card is up to 100 mm free air. On the one hand, this distance enables users to carry out transactions fast and conveniently. On the other hand, card holders decide in a distinct action whether they want a transaction to happen or not. At compulsory transactions like e.g. passport control at a limited corridor, the distance is up to 1000 mm free air. At data transmission, the card does not have to be taken out of the wallet, a bag or the like.

Further advantageous is the fast data transmission. The present invention uses for the card a high speed RF communication interface. Due to this high speed, a complete ticketing transaction for a common flight ticket can be handled in less than 0.4 seconds, even if the card holder does not stop at the reader and does not take out the card of the wallet, although there are coins in it. This allows a much higher throughput at ticket - and/or passport controls in comparison to contact card systems like magnetic stripe cards

Further advantageous is, that if more than one card enters the operating field, which is very likely to happen, the fast anticollision algorithm prevents that data transmitted between the different cards and the reader confuse the system. Cards can be selected individually. An ongoing transaction with a selected card is not corrupted by cards remaining in the field or cards moving into or out of the field. Possible data corruption and fraud caused by more than one card in the field are avoided. If card users have more than one card in their wallet, the anticollision algorithm enables the system to select the appropriate card for the transaction.

Further it is advantageous that the mutual challenge and response authentication, data cyphering and message authentication code protect the system from any kind of fraud. These security mechanisms are carried out very fast and add only little to transaction time. The arithmetic increment and

decrement capabilities of the card with individual access conditions add additional security. Assignment of separate keys to each of these commands allows the use of a key hierarchy within the system resulting in lower system costs.

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Further advantageous is, if the specific PIN code is fed incorrectly for three times, the functionality is interrupted and a ten-digit reset code must be fed in order to reactivate the functionality of the card.

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Advantageous is also the use of solid state components without any moving mechanical parts. By that, high reliability is achieved. The cards are passive, that means they are working without battery. Further, the construction of the card is simple and consists only of a coil with a few turns and a single chip embedded in plastic. Therefore the card is resisting to break, dirt and extreme temperatures. In addition, the contactless technology avoids that contacts become worn out and reduces risk and cost of vandalism.

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Further known are contactless data transmission systems for cashless payment and/or identification of persons. Disadvantageous is the possibility of misuse, because the card is insufficiently protected only by signature or PIN code.

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Especially to point out and advantageous at the present invention is the storage of biometric characteristics of the card holder as unique and unerring identification mark on each card. The threedimensional geometry of the hand and/or face of the card owner is recorded and stored on the card, from where it can be called in at any time for the identification of the card user excluding any kind of misuse or fraud.

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25 The microprocessor card implemented with hardwired logic works on base of radio frequency with the functionality of a multiapplication card, e.g. due to its multifunctionality, the card can be used for different independent applications.



The claims defining the invention are as follows:

Patent Claims

5 1. Special multifunctional applications for contact and/or  
contactless data transmission systems via microprocessor cards  
characterized in that the microprocessor card working on radio  
frequency base implemented with hardwired logic is  
10 multifunctional, e.g. several functions independent from  
eachother can be united on one card.

15 2. System according to claim 1, characterized in that one of the  
application is to store biometric characteristics of the card  
holder on the card which are unique and non-transferable and  
present an unerring possibility of identification of the card  
user. Especially, the threedimensional geometry of the hand  
and/or face of the respective card owner is stored on the card,  
from where these data can be called in for the identification of  
20 the user by special readers without annoyance of the card  
holder.

25 3. System according to claim 1,2, characterized in that one of  
the aplications present a so called electronic flight ticket  
with all qualities and connected possibilities compared to  
existing flight tickets including all data of existing flight  
tickets with additional information and data which are  
advantageous for the card holder as well as for the system user,  
e.g. airlines, operators for passenger check-in at airports.  
30 Further characterized in that with the electronic flight ticket  
new time saving control and check-in transactions are possible  
compared to usual controls at air travelling.

35 4. System according to claim 1,2,3 characterized in that it is  
possible to order personally one or more electronic flight  
tickets via internet, telephone or interactive television and  
the electronic flight ticket can be loaded by the customer  
himself at home or in the office within a spl... second on his

card via appropriate technical facilities like e.g. fax modem, PC and antenna. Further characterized in that new - compared to usual flightticket booking - immense time saving booking possibilities are connected with electronical flight tickets.

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point of time and place of the transaction as well as the invoice amounts. Further characterized in that by the input of a PIN code and/or biometric identification (hand or face geometry) in the money debiting reader, a legal use of the electronic purse is possible. (without PIN code, biometric identification - face and/or hand geometry - a transaction is impossible) Further characterized in that if the specific PIN code is fed incorrectly for three times, the functionality is interrupted and a ten-digit reset code must be fed in order to reactivate the functionality of the card.

9. System according to claim 1,2,3,7, characterized in that all applications like electronic flight ticket, electronic passport, electronic purse, electronic credit card, electronic ID or driving licence can also be used separately on one card always combined with biometric identification (face and/or hand geometry) as well as identification number (PIN code).

10. System according to claim 1,2,3,7, characterized in that one of the applications represents an electronic passport and/or visa for the unerring, fast identification of persons at boarder traffic and/or for domestic personal control. Further characterized in that a data transmission with regard to the quantity of data of common passports into networks takes less than 0.1 seconds (no jams in front of frontier crossing points).

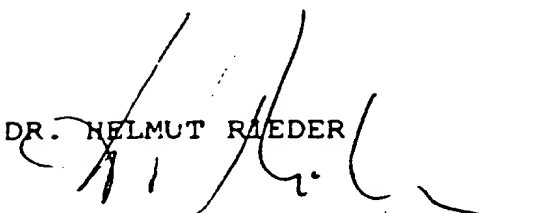
11. System according to claim 1,2,3,7,9, characterized in that one of the applications represents the use as data carrier for all credit cards on the market like VISA, American Express, Diners Club, Eurocard a.s.o. These electronic credit cards are used in connection with biometric identification of the legal owner and cannot be misused in case of theft or loss. Further characterized in that if no hand- or face geometry reader is available, by the input of a PIN code in the data reader, the legal use of electronic is rendered possible (Without PIN code, a use of electronic credit cards is therefore not possible)

Further characterized in that if the specific PIN code is fed incorrectly for three times, the functionality is interrupted and a ten-digit reset code must be fed in order to reactivate the functionality of the card.

- 5 Further characterized in that with regard to the application of electronic credit cards, with which payments can be transacted by debiting money amounts from the card, the latest records of expenses (reasonably the latest 20, of course it can be more) can be stored on the card to give the customer the possibility  
0 of a better control over his expenses or to be able to complain. These electronic vouchers include point of time and place of the transaction as well as the invoice amounts.

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DR. HELMUT RIEDER

26TH OF APRIL 1995

Abstract of the Disclosure

Special multifunctional applications for contact and/or contactless data transmission systems via microprocessor cards for the unerring identification of persons at boarder traffic and/or for the control of persons domestically as well as especially in the field of airtravelling (but also for everyday), from preparation until finalizing, useful referring to velocity and execution of necessary transactions as well as for the security of passengers.

Especially e.g. for the execution of air travelling formalities referring to the passenger like booking and/or rebooking of flighttickets, reservations, check-in, ticket control at the gate, ticketcontrol at boarding, individual information, payment of expenses.

By the storage of specific biometric characteristics of the card holder on the card, namely the threedimensional hand- and/or face geometry, a definite, unerring identification of the card holder is possible.

The microprocessor card implemented with hardwired logic works on base of radio frequency with the functionality of a multiapplication card, e.g. due to its multifunctionality, the card can be used for different independent applications.

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# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

PUBLICATION NUMBER : 05035935  
PUBLICATION DATE : 12-02-93

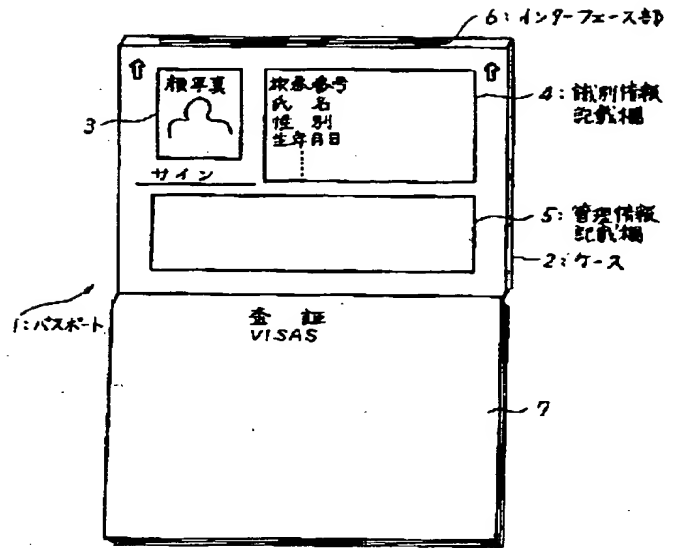
APPLICATION DATE : 26-07-91  
APPLICATION NUMBER : 03187315

APPLICANT : YOKOGAWA ELECTRIC CORP;

INVENTOR : MIKAWA EIJI;

INT.CL. : G06K 17/00 G07C 9/00

TITLE : PASSPORT AND IMMIGRATION  
SYSTEM UTILIZING PASSPORT



ABSTRACT : PURPOSE: To shorten a waiting time and to settle congestion by automatically performing various checks in an immigration inspection office.

CONSTITUTION: A passport 1 is constituted of an identification information storage part for specifying bearers, a storage part storing confirmation image information for confirming bearers, a nonvolatile storage means having a control information storage part for an immigration, a case 2 storing the storage means and an interface part 6 to the storage means. This system is constituted of a person recognition means for entering persons and departing persons, an information reading means reading person confirmation image information, identification information and control information stored in the passport 1, a legitimacy decision means comparing the image information obtained from the person confirmation means with the image information within the passport and deciding the legitimacy of the passport 1 and the legitimacy of bearers based on the read identification information and control information and a control information writing means writing the control information for immigration in the control information storage part of the passport 1.

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